

Using Data to Promote Student Success



A Brief Guide to Assist School Administrators in Interpreting Their Data

Education Quality and
Accountability Office



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Grade 9 Assessment of Mathematics

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Learning from data is central to our overarching responsibility as educators—being accountable for the success of each and every student.

Marguerite Jackson, CEO, Education Quality and Accountability Office

Introduction

Every student deserves to be successful in his or her education. Understanding and acting upon contextual as well as assessment data allows a school learning community to focus attention on ensuring that students thrive in their schooling.

Examining the data summarizing student performance on EQAO assessments is one step that administrators and teachers take in the process of reflecting on their professional practice and identifying strategies to improve student achievement and close the gap between low- and high-achieving students.

The interpretation or analysis of data is a search for meaning, patterns and relationships. The primary purpose of analyzing data is to identify areas of strength as well as areas for improvement that, when addressed, will lead to greater success for students. The numbers are indicators of what is happening, but they don't represent the whole story. You need to look beyond the numbers to gain a full understanding of what they represent. This analysis or interpretation phase is really a questioning phase on the road to understanding.

This guide outlines some questions that school administrators and teachers might find helpful in the examination of their data. In most cases, you will not be able to answer all of the questions just by looking at the results. You will need to examine other information available in your school; talk to other people in your board, such as curriculum staff, administrators and teachers in other schools; and read current literature about best practices in other jurisdictions.

Getting Started

This guide is divided into the following areas of focus:

- I Guiding Principles
- II Useful Resources
- III Questions to Consider in Examining Data
 - A. Contextual Data
 - B. Achievement Data

I Guiding Principles

The following are principles to keep in mind as you begin to examine your data.

1. Large-scale assessments provide comparable year-to-year data on student achievement that can be valuable for schools and boards in improvement planning. The Grade 9 assessment assesses the mathematics skills that students are expected to have learned by the end of Grade 9 as outlined in *The Ontario Curriculum*.
2. This assessment captures performance at a specific point in time. Results should be considered together with other school information about student performance in mathematics.
3. The applied and academic mathematics programs are different and should be considered separately.
4. Each school is unique, and to appreciate the distinctive character of a school or a board, it is necessary to understand the features and characteristics of the community it serves.

5. It is important to exercise caution when interpreting percentage changes where the numbers of students are small. For example, in a group of 30 students, a difference of 10% represents only three students.
6. In assessing results over time, small increases or decreases from one year to the next are less important than the general trend.

II Useful Resources

The following are reports and documents that may be useful during the process of examining your school's contextual and achievement data and identifying goals for improvement.

Curriculum, Assessment and Improvement Planning*

- *The Ontario Curriculum, Grades 9 and 10: Mathematics* (revised 2005). Note that considerable changes have been made to the applied courses in particular.
- The *Grade 9 Assessment of Mathematics Framework* provides an overview of the components of the test and an explanation of how it relates to *The Ontario Curriculum*.
- The released Grade 9 assessment materials (the Sample Assessment Questions), which administrators and teachers may find helpful in understanding the nature of the tasks students were asked to undertake and how the scoring criteria were applied.
- *EQAO Guide to School and Board Improvement Planning*. Examining data to develop understanding and to begin to establish a focus for school improvement is one step in the full school-improvement planning process. This document provides detailed descriptions of all the steps to be followed.
- The primary division, junior division and Grade 9 provincial report. Refer to the “Strategies for Success” section of the provincial report for suggestions and recommendations related to specific areas identified for improvement. Refer to the “School Success Stories”

* These materials are available on the EQAO Web site, www.eqao.com.

section for a brief look at the strategies used by some Ontario schools and boards to improve literacy and mathematics skills.

School, Board and Provincial Results

The following information is available for all students in the applied and academic mathematics programs on the secure portion of the EQAO Web site.

- School Report*
- Detailed Results[†] (Note that only school and board data are provided for the first release of results; provincial data are added for the second release.)
- Skill-Focused Reports[†]:
 - Profile of Strengths and Areas for Improvement (results for participating students)
 - Item Information Report: Student Roster (for all participating students)
- The Individual Student Data File[†], which includes achievement and demographic data for each student in a format that allows for further analysis
- Data files[†] with the information presented in the Item Information Report: Student Roster

Additional School Data

Administrators and teachers may achieve a fuller understanding of their Grade 9 results if they consider them in the context of other information available to schools, such as classroom tests, report card marks, attendance and mobility data.

* The School Report, with suppression rules applied, is available on the public and secure portions of the EQAO Web site.

† These reports are available on the secure portion of the EQAO Web site.

III Questions to Consider in Examining Data

One tip for getting started is to consider the “4C’s of Interpreting Data.”*

Are the data you have

- complete?
- consistent?
- comparative?
- concealing?

A number of questions are presented in the following sections to promote thinking about how to use the 4C’s as a framework for examining your data.

A. Contextual Data

There are three sources of information in the school and board reports that can be reviewed to set the context for your examination of achievement data. They are

- demographic information (e.g., gender, English language learner and special needs status, language background, semester of study);
- participation information (the number and percentage of students who received accommodations, special provisions or had no data)
- the summary of responses to the Student Questionnaire for all students and for females and males; the questionnaire results provide information on topics such as attitudes toward mathematics and students’ use of various resources.

The contextual information is provided to EQAO by the school through the **Student Data Collection** process or the **Student Information Form** or reported by students through the **Student Questionnaire**.

* The concept of the “4C’s of Interpreting Data” was first developed by the research and evaluation staff of the former North York Board of Education and was incorporated into workshops on data analysis and interpretation provided for administrators by the Assessment Training Consortium (a partnership among six Ontario district school boards).

Consider the following questions as you begin your examination of these data:

Are the data complete?

Do you have additional demographic data that complement the data gathered by EQAO and that would provide a more comprehensive picture of your school community? For example, do you have data about the socio-economic status of your community or mobility rates of your student population?

How do the demographic and contextual data for your school this year compare with those of previous years?

If there are significant changes in participation rates, in accommodation or special provision rates, or in the makeup of your student population in terms of English language learners or students with special needs, you may need to take these differences into account when you consider trends in your achievement data over time. You may also want to consider whether any changes point to a need to review or re-evaluate decisions, policies or procedures in your school.

How do the contextual and demographic data for your school compare with those of your board or the province?

How does your school's percentage of participating students compare to that of your board or the province? If your school's participation rate is much lower than that of either your board or the province, what are the possible explanations? What circumstances relating to your student population might account for these differences?

Similarly, how do the rate of accommodations and the rate of special provisions in your school compare with those of your board and/or the province? How does the rate of participation in your school compare with that of your board and/or the province?

Does your school have a significant number of English language learners or students with special needs? If the profile for your school differs from that for your board or the province, you may need to keep this in mind as you examine your achievement data and identify strategies for improvement. Some strategies may be more effective with some groups of students than with others.

What did students report about their attitudes toward mathematics?
 How does the pattern of responses for your students compare with those for your board and the province? Are there differences between the pattern of responses for males and for females?

After reviewing the contextual data, what are the two or three key points to keep in mind as you examine your achievement data?

B. Achievement Data

The Detailed School Results provide achievement data for all students in the Grade 9 applied and academic mathematics programs, for participating students and for particular groups of students (i.e., males and females, English language learners, students with special needs [excluding gifted] and students in Semester 1, Semester 2 and full-year courses).

Skill-focused reports are useful for examining performance in more detail, as they provide information about variations in performance across strands and items on the EQAO assessments. The following are available on the secure portion of EQAO's Web site:

- the Item Information Report: Student Roster and interpretation guide
- the Profile of Strengths and Areas for Improvement, including guidelines for interpretation

Have you captured the complete picture?

Schools are rich repositories of information about their students and their achievements. Results from the EQAO assessment, while providing data for all students across the province with respect to a common yardstick, are a snapshot of student performance at one point in time. To develop a full understanding of your students and their achievements, it is important to include in your examination information gathered by teachers through ongoing classroom observations and assessments throughout the year.

This information could include both formal and informal data, such as

- report card marks,
- student attendance data,

- behaviour incident reports,
- rates of homework completion,
- information about student participation in class activities and assignments and
- credit accumulation and graduation rates.

In addition, you may have data from board- and/or school-administered achievement tests or surveys.

Are results from various sources consistent?

One of the first questions you will want to address is: are the results of the EQAO assessments consistent with what you know about your students through teachers' ongoing classroom assessments and report card marks?

In other words,

- do the students who perform well on a daily basis also perform well on the EQAO assessment?
- do the students who perform poorly on the EQAO assessment demonstrate difficulty in acquiring skills and knowledge in the classroom?
- are the overall results for your students consistent with your expectations? Is the percentage of students achieving the provincial standard (i.e., Level 3 or above) what you expected?

If there are inconsistencies, consider

- whether teachers have a complete understanding of the curriculum expectations and what student work at each achievement level looks like;
- whether teachers' assessments of the adequacy of student work are consistent with curriculum expectations and
- whether anything happened during the EQAO assessment that may have had an impact on the results.

How do results for your school compare to the standard, your targets, your board's results, the province's results or similar schools' results?

Information is often more meaningful when a point of comparison is available. Comparisons help to enhance our understanding. However when making comparisons, keep in mind that you are searching for meaning, not making judgments.

You might consider the following comparisons:

- *comparison with the provincial standard:* What percentage of students in your school are performing at Level 3 or higher?
- *comparison with your school's target for improvement:* Did your school meet its target for improvement? If not, do you have an understanding of why; if yes, did the target reflect a challenging enough goal for the students at your school?
- *comparison of results over time:* Are there any positive or negative trends? When considering variations in performance from one year to the next, keep in mind whether the number of students is small, student mobility is high or student demographics have changed.
- *comparison of results with those of your board and the province:* Are the patterns of results in your school similar to or different from those of your board and the province? If the results are different, can these differences be explained by your school's program delivery, teacher qualifications, available resources, and/or professional development opportunities? If the differences in results favour your school, perhaps other schools could learn from your success.

Consider how your school's demographic profile may differ from that of the board or the province. Identify the special characteristics of the students or the community your school is serving and consider how well the range of student needs is being addressed.

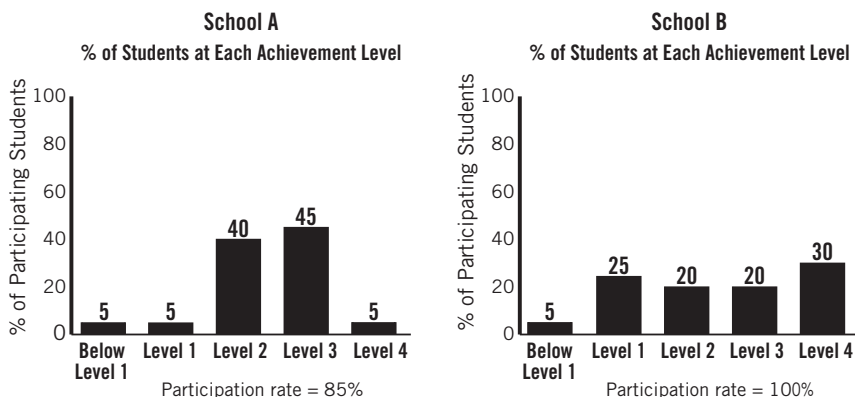
- *comparison with schools similar to yours:* Comparing your school's results with those of other schools is another way to gain further insights about your results. Such comparisons will be valid only if you compare your school to other schools that are similar in terms of demographics and other contextual variables. You need to

compare oranges with oranges! If schools similar to yours are achieving better results, you will want to find out why. What are they doing that has had a positive impact? Is it something that your school should consider? If your school is achieving better results than a similar school and you are clear about what is making the difference, look for opportunities to share the ingredients of your school's success.

Is anything concealed?

- (i) Have you considered the full distribution of results?

Sometimes we look only at the percentages of students performing at or above a certain level, such as the provincial standard. But if you want the whole story, you need to look at the full distribution of results. Consider the following graphs.



These schools had the same percentage of students at or above Level 3, but the underlying story is quite different. For example,

- the percentages of students at Levels 1 and 4 in these schools are quite different.
- the percentage of participating students in each school is quite different. This may partially explain the difference in the percentage of students performing at Level 1 at each of these schools.

If actions are planned based only on the percentage of students performing at Level 3 or above, you could be missing opportunities for improvement!

- (ii) Digging deeper: Have you examined the performance of particular groups of students?

Often, further understanding of results arises from “disaggregation” of the data, that is, through examining the performance of various groups of students. This examination might consider factors such as gender, English language learner and special needs status, length of time in Canada, enrolment in semestered versus full-year courses, attendance and student attitudes. The following are some questions to ask:

- Are there differences in the performance of females and males? English language learners? Students with special needs? In what areas are there gaps? What programming might help to bridge the gaps?
- Are there differences in the performance of English language learners based on the length of time they have been in Canada? (Be cautious about reaching conclusions when the number of students involved is small.)
- Who are the low-achieving students? * What are their characteristics? What supports and/or programs are in place to address their needs?
- Who are the high-achieving students? * What are their characteristics? What is contributing to their success?
- Are there any differences in the performance of students enrolled in semestered versus full-year courses? Do any changes need to be considered?
- Do students who are absent more than the average perform differently than students who attend school consistently?
- What is the relationship between the students’ attitudes and achievement?

* This information can be obtained through an analysis of the Individual Student Data file available on the secure portion of the EQAO Web site.

A Final Note

As will be clearly evident by now, examining your data is a process of asking questions in a search for meaning and understanding. Remember, this examination is **one step** in the process of school improvement planning. The careful examination and use of data gives large-scale tests like the EQAO Grade 9 Assessment of Mathematics their power to drive improvement, to provide insight into areas of strength and weakness, and to help ensure that the right programs are directed to the right students.

Once you have identified areas to focus on, you will need to consider strategies to help you achieve the goals you have established. Principals have told us that they use a wide range of strategies to improve mathematics skills among their students. These strategies include the establishment of mathematics committees, encouraging all teachers in the school to assume responsibility for mathematics, assemblies, tutoring, small-group meetings with students, communication with parents and providing opportunities for students to practise demonstrating the skills tested by the EQAO assessments.

The requirement to challenge all students to meet standards is not negotiable! We must provide the best education for all students. Educators get the best information about their students when they compile data from a number of sources, including classroom assessments, report card marks and the EQAO assessments.

We hope this guide has been helpful in getting you started on the examination of your data.

Next Step: Refer to EQAO's *Guide to School and Board Improvement Planning* for strategies for using these results in formulating your school improvement plan.

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